

Identification of important sectors and coefficients: comparison of the productive structure of Mexico and Brazil.

Topic: Input-Output Tables as a Network I

Author: Itzel Guadalupe Vázquez López

Co-Authors: Eric Hernández Ramírez, Jair Soto, Omar Eduardo Peredo Aquino

In this article, we present a comparison of production structures between Brazil and Mexico. These economies are the largest in Latin America representing up to 70% of national income in the region. To make these comparisons, we employed input-output matrices available for both countries in the years 1980 and 2005 (in the case of Mexico for 2003). These matrices were harmonized to an aggregation of 39 sectors, which is the highest compatibility that can be obtained. The period between 1980 and 2005, reveal changes in development strategies followed in both economies from the period that concludes the so called ISI model, i.e. an import substitution industrial development. This paper starts from the assumption that the 1980 matrices reflect the economic structure developed during the three decades preceding that year, that is, the full deployment of ISI model. We present a set of measures and graphs that portray those economies. From the mid-80s, the authorities of both economies adopted measures that substantially modified the model of development until then prevailing, as a result of macroeconomic instability in those years. The events in the economic sphere in those countries during the 80s has been called "the lost decade", because the macroeconomic adjustment and stabilization of both economies led during those years, to a dramatic decrease in growth rates economic hitherto achieved, as well as a reduction of revenue for most of its population. From stabilization policies adopted, the governments of Brazil and Mexico gradually started to build a new model of economic growth. The new model include a series of macroeconomic measures that emphasize decreasing state involvement in the economy; removing exchange controls; removing trade barriers; a new structure of public finances that emphasize a balanced budget, and other measures that have been synthetically referred to as the "neoliberal model" (NM). In this paper, the configuration of the economy of both countries is studied through its input-output matrices for the year 2005, which are, somehow, the result of the configuration of the structure of these economies after more 25 years of implementing measures of NM model.

The tools for making comparisons in the structures of the economies of Mexico and Brazil, are based on the estimation of important coefficients (ICs) and important sectors (ISs) following the methodology proposed by Joachim Schintke and Reine Staglin (1988); in the same article, the authors proposed the use of their methodology for input-output tables normalized both by columns and rows. We interpret a particular set of ICs as a graph and obtained for it several social networks indicators. Also, the Tolerable Limits approach of Schintke and Stagling methodology, allowed us to apply a connectivity test of the graph in order to tune the parameters of the method and get a better portrait of the studied economies.

The level of economic integration in a country is characterized by its concentration of ICs, which determine the fundamental economic structure of such a country. A country with a relatively high number of ICs spread across the network of inter-sectoral relationships is likely to be highly integrated. From a development policy perspective, a general level of economic integration is a good thing, since it means that most sectoral policies will spread their effects widely within the productive network. Hence, the location and frequency of ICs can be used in determining the direction and nature of economic policies. However there are several limitations for the application of such an approach in certain situations. The first one, relates to the ceteris paribus nature of the method. That is, it assesses the importance of a given direct coefficient supposing only this one coefficient changes, so it would seem to be more desirable to assess the overall

importance of a set of coefficients than of a single, isolated coefficient. From this perspective, we interpret a set of important coefficients as a Graph (in the sense of the social networks analysis) and consider the importance of joint coefficient changes. We obtained several measures of the networks that are useful to broaden the understanding of the ICs. Other generalization of the ICs is to identify key-sectors, checking the importance of columns or rows of coefficients; in this case we applied the methodology proposed in the same article of Schintke and Staglin, which is an extension of their TL important coefficients approach.

Keywords: significant coefficients, important sectors, connectivity, graphs and productive structure.